

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-2 (Canceled).

Claim 3 (Previously Presented): The process of Claim 26, wherein the heat is supplied during one of the two operations (b) and (c).

Claim 4 (Currently Amended): The process of Claim 26, wherein the solid is reacted in the first reaction zone with ~~at least one~~ an agent selected from the group consisting of H_2O , ~~and~~ CO_2 , and mixtures of thereof.

Claim 5 (Previously Presented): The process of Claim 4, wherein the solid is reacted in the first reaction zone with H_2O .

Claim 6 (Previously Presented): The process of Claim 26, wherein the solid to be oxidized in the first reaction zone comprises at least one element having at least two different oxidation states, stable under the reaction conditions.

Claim 7 (Previously Presented): The process of Claim 6, wherein the solid, in the two different oxidation states is further characterized by different amounts of oxygen and enthalpy and is capable of cyclically and continuously passing from the reduced form to the oxidized form, and vice versa.

Claim 8 (Previously Presented): The process of Claim 7, wherein at least one redox element is present in the solid as a binary compound corresponding to the formula



wherein Me is selected from the group consisting of Ce, Fe, W and Ni;

or as a compound corresponding to the formula



wherein Me is one or more elements selected from the group consisting of Ce, Pr, Co, Ni, Fe, Mo and W;

Z is one or more elements selected from the group consisting of Ce, Zr, V and Mo;

$x \geq 1$, $y \geq 0$ and $z \geq 1$.

Claim 9 (Previously Presented): The process of Claim 8, wherein Me is Fe.

Claim 10 (Previously Presented): The process of Claim 9, wherein the Fe is present in the solid in a quantity ranging from 20 to 60% by weight.

Claim 11 (Previously Presented): The process of Claim 10, wherein the Fe is present in the solid as a binary compound together with a binary compound of cerium and/or a compounds corresponding to formula (I) or (II), wherein Me is Fe and Z is Ce.

Claim 12 (Previously Presented): The process of Claim 11, wherein the compound corresponding to formula (I) is Fe_2O_3 .

Claim 13 (Previously Presented): The process of Claim 9, wherein the solid also contains a metal as promoter selected from the group consisting of Pt, Pd, Au and Rh.

Claim 14 (Previously Presented): The process of Claim 13, wherein the promoter is in a percentage ranging from 0.01 to 2% by weight.

Claim 15 (Previously Presented): The process of Claim 9, wherein the solid also contains a transition metal as promoter selected from the group consisting of Cr, Mn, Nb and V.

Claim 16 (Previously Presented): The process of Claim 15, wherein the promoter is in a percentage ranging from 0.1 to 15% by weight.

Claim 17 (Previously Presented): The process of Claim 12, wherein chromium is present as promoter.

Claim 18 (Currently Amended): The process of Claim 8, wherein the redox element thus obtained can be used ~~as such~~ alone, or dispersed or supported on compounds selected from the group consisting of ~~at least one of~~ silica, alumina, oxides of magnesium, calcium, cerium, zirconium, titanium, ~~and lanthanum,~~ and mixtures thereof.

Claim 19 (Previously Presented): The process of Claim 8, wherein the redox element is present in a quantity ranging from 20 to 80% by weight with respect to the compound which forms the carrier or the dispersing phase.

Claim 20 (Canceled).

Claim 21 (Previously Presented): The process of Claim 26, wherein the hydrocarbon is CH₄.

Claims 22-25 (Canceled).

Claim 26 (Currently Amended): A process for the production of hydrogen and carbon dioxide comprising:

- a) oxidizing a solid in a first reaction zone to produce hydrogen;
- b) passing the oxidized solid to a second reaction zone into which a reducing stream comprising hydrocarbon as reductant is fed and reacting the oxidized solid with the hydrocarbon to produce carbon dioxide;
- c) recovering the reduced solid and feeding it to the first reaction zone;
- d) wherein heat is supplied by use of a supplementary thermal support unit situated between the two reaction zones, the heat being supplied by using the heat which develops due to the further oxidation of the solid with air.

Claim 27 (Previously Presented): The process according to Claim 26, comprising: sending the gaseous phase produced during the reduction of oxidized solid to a separation section which allows the separation of the complete combustion products (CO₂ and H₂O) from any non-converted hydrocarbon;

optionally recycling the gaseous phase to the second reaction zone in which the reduction of the oxide takes place and/or to a further reaction zone, to enable complete conversion of the gaseous phase to provide complete combustion products (CO_2 and H_2O);
and

eliminating from the cycle the complete combustion products (CO_2 and H_2O) coming from a purification section.

Claims 28-32 (Canceled).

Claim 33 (Previously Presented): The process of Claim 26, wherein the reducing stream consists essentially of hydrocarbon.